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2861

DATE MAILED: 10/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/803,671

Applicant(s)

IKEZAKI ET AL.

Examiner

Anh T.N. Vo

Art Unit

2861

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 July 2006 and 01 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10, 16, 19, 23, 24, 28 and 31 is/are allowed.
- 6) ☒ Claim(s) 1-9, 11-15, 17, 18, 20-22, 25-27, 29, 30 and 32-42 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

NON-FINAL REJECTION

The claim rejection under 35 USC 102 (e) over Higuma et al. (US Pat. 6,796,643) is withdrawn in view of the amendments to the claims and the arguments presented in the amendment.

CLAIM REJECTIONS

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 42 is rejected under 35 USC 102 (b) as being unpatentable over Tajima et al (US 6,467,890).

Tajima discloses in Figures 18-20B and 30 a printing device comprising:

- an ink tank (1000) and the inkjet head (2000) being mounted on a movable carriage (2, Figure 30) which is reciprocally movable along a horizontal direction, the ink tank including: an ink room that reserve the ink to be supplied to the inkjet head (2000), see Figure 13 and 30; and
- a dividing member (1100a) that divides at least a portion about a surface of the ink reserved in the ink room into a plurality of sections (1100, 1200) arranged in a movable direction of the carriage (2), see Figures 20A and 30.

Claim Rejections - 35 U.S.C. § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2861

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2, 4-5, 9, 11-14, 21-22, 25, and 32-41 are rejected under 35 USC 103 (a) as being unpatentable over Tajima et al. (US Pat. 6,467,890) in view of Yonekubo (JP2002205413).

Tajima et al. disclose in Figures 21A-23D and 30 an ink tank for an ink jet printer comprising:

- an inkjet head (2000, column 16, line 19-20) that ejects ink onto a recording medium (10) (Figures 13 and 30);
- a movable ink tank (1000, column 16, line 17 or C, Figure 30) having an ink introducing opening (1205, column 22, line 3), an ink storing space (1100, 1200) in which ink introduced through the ink introducing opening (1151) is stored, and an ink discharging opening (1101) through which the ink of the ink storing space (1100, 1200) is supplied to the inkjet head (2000) (Figure 18);
- a carriage (2) that supports the inkjet head (2000) and the movable ink tank (C), the carriage reciprocating in a direction perpendicular to a feeding direction of the recording medium (10), wherein the movable ink tank (1000 or C) includes a partition wall (1100a or 215) that divides the ink storing space into multiple rooms (1100, 1200), the multiple rooms being arranged in a direction parallel to a reciprocating direction of the carriage (2), the multiple rooms being in fluid communication with each other at upper portions thereof, the partition wall (1100a or 215) having a portion extending in a direction substantially perpendicular to the reciprocating direction of the carriage (2) (Figures 10A-10B, 18, 20A-23C and 30);
- wherein the partition wall (1100a) divides the ink storing space into a first ink room (1200) being in fluid communication with the ink introducing opening (1205) and a second ink room (1100) being in fluid communication with the ink discharging opening (2000) (Figures 23A-

Art Unit: 2861

23C);

- wherein the partition wall (215) consists of the portion which is substantially perpendicular to the reciprocating direction of the carriage (main scan direction, Figure 10B);

- wherein the ink introducing opening (1205, column 22, line 3) is arranged so that the ink is introduced into the movable ink tank (1000) in parallel with the partition wall (Figures 23A-23C);

- wherein the ink introducing opening (1206) is located lower than a top edge of the partition wall (Figure 23A);

- wherein the movable ink tank (1000) includes a divider plate (1103) protruding downward from a ceiling of the ink storing space, the divider plate (1103) dividing an upper part (1104) of one (1100) of the multiple rooms (1100, 1200) defined in the ink storing space (Figure 18);

- wherein a lower end of the divider plate (1003) is located lower than a top edge of the partition wall (1100a) (Figures 13 and 18);

- wherein a lower end portion of the divider plate (1103) and an upper end portion of the partition wall (1100a) face each other (Figures 13 and 18);

- wherein the movable ink tank (1000) includes multiple divider plates (1003) protruding downward from respective ceilings of the multiple rooms defined in the ink storing space (Figure 18);

- an ink tank (1000 or C) to be connected with an inkjet head (2000) for supplying ink to and moving integrally with the inkjet head when the inkjet head reciprocates to print on an object (10), the ink tank comprising:

- a first ink room (1200) that receives the ink from a stationary ink source (not shown) through an ink introducing opening (1205) (Figure 13);

- a second ink room (1100) that receives the ink from the first ink room (1200) and supplies the ink to the inkjet head (2000), wherein both the first and second ink rooms (1200, 1100) are formed narrower in a reciprocating direction of the inkjet head (2000) than in a direction perpendicular to the reciprocating direction (Figures 13, 18, 23A-23C and 30);

- an ink introducing channel (1206) that introduces the ink from the stationary ink source (not shown) into a lower part of the first ink room (1200) (Figure 23a);

- wherein the lower part of the first ink room (1200) includes an expanded portion (1201) that

expands in a direction perpendicular to the reciprocating direction (Figure 13);

- wherein the ink introducing channel (1206) introduces the ink into the first ink room (1200) vertically downward (Figure 23a);

- wherein the first and second ink rooms are (1200, 1100) arranged in the reciprocating direction and separated from each other with a plate like wall (1100a) formed perpendicular to the reciprocating direction, and wherein the ink introducing channel (1206) introduces the ink into the first ink room (1200) in parallel with the reciprocating direction (Figures 13, 23a-23c and 30);

- an ink discharging opening (1101) formed on a bottom of the second ink room (1100) for discharging the ink into the inkjet head (2000) (Figure 18);

- a divider (1103) that divides a surface of the ink in one (1100) of the first and second ink rooms (1200, 1100) into smaller areas (Figure 18);

- wherein the divider (1103) divides the surface of the ink in the reciprocating direction;

- wherein the divider (1103) divides the surface of the ink into substantially halves;

- wherein the divider (1103) is a plate extending perpendicularly to the reciprocating direction; and

- wherein the plate (1103) protrudes downward from a ceiling of one (1100) of the first and second ink rooms (Figure 18).

However, Tajima does not disclose that the upper portions of the multiple rooms being located opposite and distal from the inkjet head in direction substantially perpendicular to the reciprocating direction of the carriage and substantially perpendicular to the feeding direction of the recording medium.

Nevertheless, Yonekubo suggests in Figure 1-4 an ink cartridge comprising a partitioned wall (8) for dividing the ink reservoir into rooms (2a, 2b) and allowing fluid to flow at upper portion which is located opposite and distal from a printhead (6) for preventing deposition of a pigment in the ink and bubbling of the ink, see the Abstract.

It would have been obvious to a person having skill in the art at the time the invention

was made to rearrange the partitioned wall of Tajima et al as suggested by Yonekubo for the purpose of preventing deposition of a pigment in the ink and bubbling of the ink, see the Abstract

Claim 3 is rejected under 35 U.S.C. 103 (a) as being unpatentable over Tajima et al. (US Pat. 6,467,890) in view of Yonekubo (JP2002205413) and further in view of Erickson (US Pat. 6,164,766).

Tajima et al. in view of Yonekubo disclose the basic features of the claimed invention were stated above but do not disclose a stationary ink tank and a tube that connects the movable ink tank with the stationary ink tank to supply ink of the stationary ink tank into the movable ink tank.

However, Erickson discloses in Figures 1-3 an ink refill system comprising:

- a stationary ink tank (14);
- a tube (60) that connects the movable ink tank (12) with the stationary ink tank (14) to supply ink of the stationary ink tank (14) into the movable ink tank (12).

It would have been obvious to a person having skill in the art at the time the invention was made to incorporate the teaching of Erickson in the Tajima et al. ink jet printer for the purpose of supplying ink from an ink supply station to an ink tank.

Claims 6-8 and 26-27 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Tajima et al. (US Pat. 6,467,890) in view of Yonekubo (JP2002205413) and further in view of Yang et al. (US Pat. 6,247,807).

Tajima et al. in view of Yonekubo disclose the basic features of the claimed invention were stated above but do not disclose at least a portion of a side wall of the movable ink tank is flexible; the flexible portion of the side wall of the movable ink tank faces the partition wall; wherein one of the multiple rooms of the movable ink tank is in fluid communication with the

Art Unit: 2861

ink introducing opening and has a side wall of which portion facing the partition wall is flexible; wherein the ink introducing opening is located lower than a top edge of the partition wall; wherein at least a part of a side wall of the first ink room facing the plate like wall has flexibility to absorb pressure fluctuation in the ink within the first ink room; and wherein the at least a part of the side wall of the first ink room is a flexible film.

However, Yang et al. disclose in Figure 6 an ink jet cartridge comprising:

- at least a portion of a side wall (14) of the movable ink tank ((1) is flexible;
- the flexible portion (14) of the side wall of the movable ink tank (1) faces the partition wall (an unmarked partition wall that has a passage 13 at a bottom end of the wall);
- wherein one of the multiple rooms (40, 60) of the movable ink tank (1) is in fluid communication with the ink introducing opening (61) and has a side wall (14) of which portion facing the partition wall (an unmarked partition wall that has a passage 13 at a bottom end of the wall) is flexible;
- wherein the ink introducing opening (61) is located lower than a top edge of the partition wall (an unmarked partition wall that has a passage 13 at a bottom end of the wall);
- wherein at least a part of a side wall (14) of the first ink room (40) facing the plate like wall has flexibility to absorb pressure fluctuation in the ink within the first ink room; and
- wherein the at least a part of the side wall (14) of the first ink room (40) is a flexible film.

It would have been obvious to a person having skill in the art at the time the invention was made to incorporate the teaching of Yang et al in the Tajima et al. ink jet printer for the purpose of providing an ink jet cartridge with a flexible wall to adjust the back pressure with the ink cartridge and to prevent ink from leakage when the ambient air pressure drops.

Claims 15, 17-18, 20 and 29-30 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Tajima et al. (US Pat. 6,467,890) in view of Yonekubo (JP2002205413) and further in view of Yoshiyama et al. (US Pat. 6,619,776).

Tajima et al. in view of Yonekubo disclose the basic features of the claimed invention were stated above but do not disclose at least a part of at least one side of the movable ink tank is light transmissive; an optical liquid level sensor that detects the ink level within the movable ink tank through the light transmissive part of the movable ink tank; wherein one of the multiple rooms of the movable ink tank is in fluid communication with the ink discharging opening and has a side wall of which portion facing the partition wall is light transmissive; an optical liquid level sensor that detects the ink level within the movable ink tank through the light transmissive portion; wherein at least a part of a side wall the second ink room facing the plate like wall is light transmissive; and wherein the at least a part of the side wall (51) of the second ink room (45) is a light transmissive film.

Yoshiyama et al. disclose in Figures 3, 5a, 6a-7c and 22a-23b an ink cartridge for an inkjet printer comprising:

- at least a part of at least one side of the movable ink tank (2 or 140) is light transmissive;
- an optical liquid level sensor (19) that detects the ink level within the movable ink tank (2 or 140) through the light transmissive part of the movable ink tank (Figures 6a and 23a);
- wherein one of the multiple rooms of the movable ink tank (2 or 140) is in fluid communication with the ink discharging opening (50) and has a side wall of which portion facing the partition wall (42) is light transmissive (Figures 5a, 6a and 23a);
- an optical liquid level sensor (19) that detects the ink level within the movable ink tank (2 or 140) through the light transmissive portion (Figures 6a and 23a);
- wherein at least a part (51a) of a side wall (51) of the second ink room (45) facing the plate like wall (42) is light transmissive (Figure 5a, column 12, line 40); and wherein the at least a part of the side wall (51) of the second ink room (45) is a light transmissive film (Figure 23a).

It would have been obvious to a person having skill in the art at the time the invention was made to incorporate the teaching of Yoshiyama et al. in the Tajima et al. ink jet printer for

Art Unit: 2861

the purpose of providing an optical ink sensor to detect with a high accuracy the amount of ink remaining in an ink cartridge.

Response to Applicant's Arguments

The applicant argues that the fluid of Tajima in communication between the compartments of the ink jet tank occur at the bottom portion of the tanks, not at the top of the tank as claimed. The arguments are persuasive. However, this limitation is suggested in the Yonekubo reference.


The applicant argues that the nozzles 73 in Figure 11B of Higuma is arranged in a left-to right orientation so that the partition wall 5 is arranged in a direction perpendicular to the movement of the carriage that is in contrary to the dividing member as claim 42 which arranged in the movable direction of the carriage. The argument is persuasive without traverse. However, this limitation is suggested in the Tajima et al reference as stated above.

Allowable Subject Matter

Claims 10, 16, 19, 23-24, 28 and 31 are allowed.

CONCLUSION

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Anh Vo whose telephone number is (571) 272-2262. The examiner can normally be reached on Tuesday to Friday from 9:00 A.M. to 7:00 P.M.. The fax number of this Group 2861 is (571) 273-8300.


ANH V.N. VO
PRIMARY EXAMINER
October 12, 2006